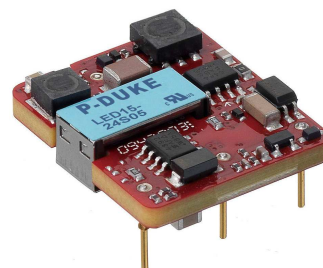


LED15 SERIES

DC-DC CONVERTER

2:1 WIDE INPUT RANGE
UP TO 15Watts



FEATURES

- NO MINIMUM LOAD REQUIRED
- 2250VDC INPUT TO OUTPUT ISOLATION
- SMALL SIZE AND LOW PROFILE : 1.10 x 0.94 x 0.34 INCH
- SURFACE-MOUNT OR THROUGH-HOLE
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

2250VDC ISOLATION	REMOTE CONTROL	UVP	OCP	SCP	OVP
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TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25°C otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load (1)
	VDC	VDC	mA	mA	%	μF
LED15-24S3P3	18 ~ 36	3.3	3500	20	86	10000
LED15-24S05	18 ~ 36	5	3000	20	87	6000
LED15-24S12	18 ~ 36	12	1250	15	87	1000
LED15-24S15	18 ~ 36	15	1000	15	88	660
LED15-48S3P3	36 ~ 75	3.3	3500	15	85	10000
LED15-48S05	36 ~ 75	5	3000	15	87	6000
LED15-48S12	36 ~ 75	12	1250	10	87	1000
LED15-48S15	36 ~ 75	15	1000	10	88	660

PART NUMBER STRUCTURE

LED15	-	48	S	05	-	A
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Option
		24: 18~36 48: 36~75	S: Single	3P3: 3.3 05: 5 12: 12 15: 15		□: Negative logic remote ON/OFF with DIP(Standard) A: Negative logic remote ON/OFF with SMT B: Positive logic remote ON/OFF with DIP C: Positive logic remote ON/OFF with SMT D: DIP type without Ctrl pin E: SMT type without Ctrl pin F: DIP type, negative logic remote ON/OFF without Trim pin G: SMT type, negative logic remote ON/OFF without Trim pin H: DIP type without Ctrl & Trim pin I: SMT type without Ctrl & Trim pin J: DIP type, positive logic remote ON/OFF without Trim pin K: SMT type, positive logic remote ON/OFF without Trim pin

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom) 48Vin(nom)	18 36	24 48	36 75	VDC
Input reflected ripple current	Nominal input and Full load		30		mAp-p
Start-up voltage	24Vin(nom) 48Vin(nom)			18 36	VDC
Shutdown voltage	24Vin(nom) 48Vin(nom)		14.5 30.5		VDC
Start up time	Constant resistive load Power up Remote ON/OFF			30 30	ms
Input surge voltage	100ms, max. 24Vin(nom) 48Vin(nom)			50 100	VDC
Remote ON/OFF	Referred to -Vin pin Positive logic DC-DC ON (Option) DC-DC OFF Negative logic DC-DC ON (Standard) DC-DC OFF Input current of Ctrl pin Remote off input current	-0.5	Open or 3 ~ 15VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 15VDC	1.0 20	mA mA

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy		-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load	-0.2		+0.2	%
Voltage adjustability ⁽²⁾		-10		+10	%
Ripple and noise	Measured by 20MHz bandwidth With a 1μF M/C X7R and a 10μF T/C 3.3Vout, 5Vout 12Vout, 15Vout		75 100		mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change, ΔIo/Δt=0.1A/us		300		μs
Over voltage protection	3.3Vout 5Vout 12Vout 15Vout	3.7 5.6 13.5 16.8		5.4 7.0 19.6 20.5	VDC
Over load protection	% of Iout rated; Hiccup mode			150	%
Output voltage overshoot			3		%
Short circuit protection			Continuous, automatic recovery		

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute Input to Output	2250			VDC
Isolation resistance	500VDC	10			MΩ
Isolation capacitance			1000		pF
Switching frequency	3.3Vout, 5Vout 12Vout, 15Vout	243 423	270 470	297 517	kHz
Safety approvals				UL60950-1 EN60950-1 IEC60950-1	
Weight				10.5g (0.36oz)	
MTBF	MIL-HDBK-217F, Full load			3.438 x 10 ⁶ hrs	

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature ⁽³⁾	With derating	-40		+105	°C
Storage temperature range		-55		+125	°C
Thermal shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	
Lead-free reflow solder process				IPC J-STD-020D	
Moisture sensitivity level(MSL)				IPC J-STD-033B level 2a	

EMC SPECIFICATIONS

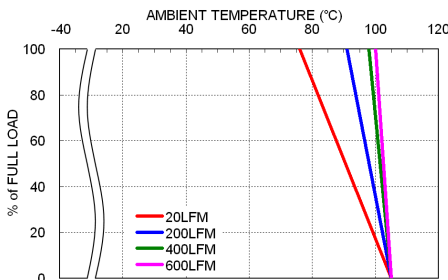
Parameter	Conditions	Level
EMI ⁽⁴⁾	EN55022	Class A, Class B
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient ⁽⁵⁾	EN61000-4-4 ± 2kV	Perf. Criteria B
Surge ⁽⁵⁾	EN61000-4-5 ± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10 Vr.m.s	Perf. Criteria A

Note:

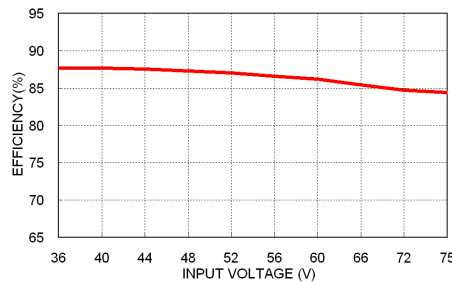
1. Test by minimum input and constant resistive load.
2. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the Trim pin and either +Vout pin or -Vout pin.
3. The power module operates in a variety of thermal environments; however, sufficient cooling should be provided to help ensure reliable operation.
4. The standard modules meet EN55022 Class A and Class B with external components. For further information, please contact with P-DUKE.
5. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220 μ F/100V.

CAUTION: This power module is not internally fused. An input line fuse must always be used.

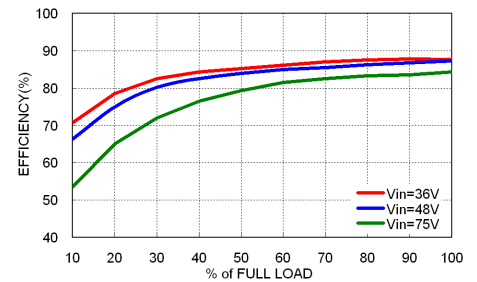
CHARACTERISTIC CURVE



LED15-48S05 Derating Curve



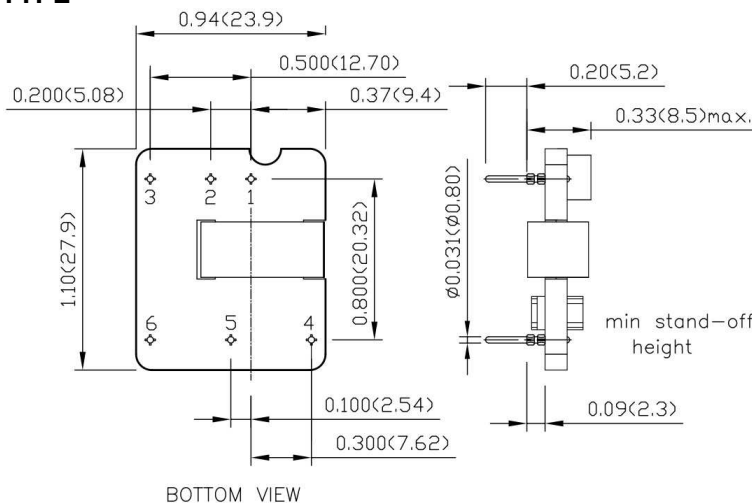
LED15-48S05 Efficiency vs. Input Voltage



LED15-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING

DIP TYPE



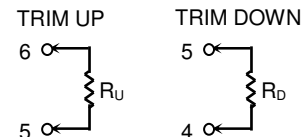
BOTTOM VIEW

PIN CONNECTION

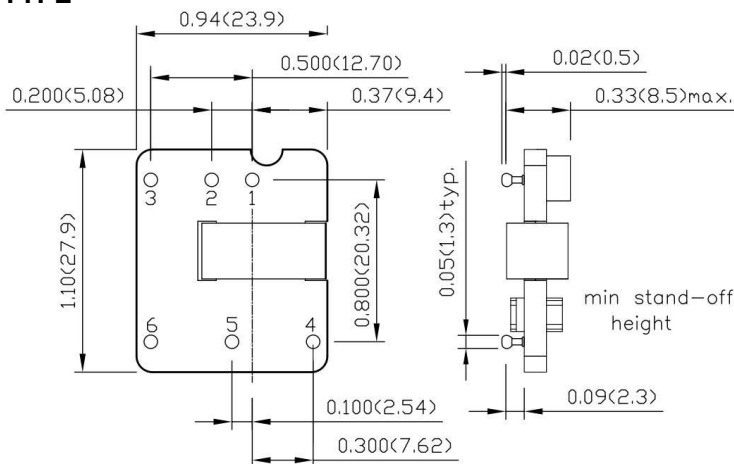
PIN	DEFINE
1	+Vin
2	-Vin
3	Ctrl
4	+Vout
5	Trim
6	-Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



SMT TYPE



BOTTOM VIEW

1. All dimensions in inch (mm)
2. Tolerance :x.xx $\pm$ 0.02 (x.x $\pm$ 0.5)
x.xxx $\pm$ 0.01 (x.xx $\pm$ 0.25)
3. Pin pitch tolerance $\pm$ 0.01 (0.25)
4. Pin dimension tolerance $\pm$ 0.004 (0.1)